

Application Serial No. 09/764,630
Response dated October 25, 2005
Reply to Office Action dated July 26, 2005

Listing of Claims

1. (Currently Amended) A syringe for mounting to an injector for injecting fluids into an animal subject, said syringe comprising:

a cylindrical barrel;

a plunger snugly slidable in said cylindrical barrel, said plunger having a rearwardly facing drive ram engaging coupling element thereon in the shape of a rearwardly facing extension, wherein said rearwardly facing extension is knurled at least along the portion of said extension adapted to be within an area enveloped by a coupling mechanism, said knurls being a series of ridges or grooves that are not adapted to interlockingly engage with said coupling mechanism, and said rearwardly facing extension does not extend outside of said cylindrical barrel in at least one position of said plunger; and

a discharge tip in fluid communication with a forward end of said cylindrical barrel.

2. (Previously Canceled)

3. (Original) The syringe of claim 1 further comprising a conical front wall disposed between said cylindrical barrel and said discharge tip.

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4. (Previously Amended) The syringe of claim 1 further comprising syringe mating sections positioned in a plane perpendicular to the longitudinal axis of the cylindrical barrel, wherein said syringe mating sections facilitate mounting of said syringe to an injector.
5. (Previously Amended) The syringe of claim 4 further comprising injector mating sections disposed on an injector wherein said syringe mating sections are arranged so as to align with said injector mating sections.
6. (Original) The syringe of claim 5 wherein said syringe mating sections include a radially outwardly extending annular flange.
7. (Previously Canceled)

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8. (Previously Amended) An injector for injecting fluids from a syringe into an animal subject, comprising;

a housing;

a plunger drive ram bidirectionally movable along an axis and mounted within said housing;

a motor drivingly coupled to said drive ram to selectively advance and retract said drive ram along said axis into and out of said housing;

a coupling mechanism operatively connected to said plunger drive ram;

a syringe for mounting to said injector comprising a cylindrical barrel, a plunger snugly slidable in said cylindrical barrel, said plunger having a rearwardly facing drive ram engaging coupling element thereon in the shape of a rearwardly facing extension, wherein no two adjacent transverse cross-sections of said rearwardly facing extension exhibit discontinuity in area when compared one to another along the portion of said extension adapted to be within the area enveloped by said coupling mechanism, and said rearwardly facing extension does not extend outside of said cylindrical barrel in at least one position of said plunger, and a discharge tip in fluid communication with said cylindrical barrel; and

a movable face plate used to position a syringe relative to said injector housing to permit said drive ram to engage and move said plunger within said syringe.

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9. (Previously Amended) The injector of claim 8 further comprising injector mating sections, said syringe further comprising syringe mating sections positioned in a plane perpendicular to the axis of the body of the syringe and arranged so as to align with the injector mating sections.

10. (Original) The injector of claim 8, wherein said face plate further comprises a rotatable lever used for translatory motion of said face plate, said lever movable between locked and unlocked positions, wherein motion of said lever to said locked position causes attachment of a syringe to said injector housing by translating said rearward facing coupling element of said syringe plunger against a coupling mechanism of said plunger drive ram to facilitate cooperative movement of said syringe plunger and said plunger drive ram to inject fluids into said animal subject.

11. (Original) The injector of claim 10 wherein movement of said rotatable lever from said locked to said unlocked position results in translatory movement of said face plate along a plane perpendicular to the axis of said plunger drive ram to disengage said rearward facing coupling element of said syringe plunger from a coupling mechanism of said plunger drive ram.

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12. (Previously Amended) A syringe for mounting to an injector for injecting fluids into an animal subject, said syringe comprising:

a cylindrical barrel;

a plunger snugly slidable in said cylindrical barrel, said plunger having a rearwardly facing drive ram engaging coupling element thereon in the shape of a rearwardly facing extension, wherein no two adjacent transverse cross-sections of said rearwardly facing extension exhibit discontinuity in area when compared one to another along the portion of said extension adapted to be within the area enveloped by a coupling mechanism, and said rearwardly facing extension does not extend outside of said cylindrical barrel in at least one position of said plunger; and

a discharge tip in fluid communication with a forward end of said cylindrical barrel.

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13. (Previously Added) A syringe for mounting to an injector for injecting fluids into an animal subject, said syringe comprising:

a cylindrical barrel;

a plunger snugly slidable in said cylindrical barrel, said plunger having a rearwardly facing drive ram engaging coupling element thereon in the shape of a rearwardly facing extension, wherein said rearwardly facing extension includes a knurled interior cavity and said rearwardly facing extension does not extend outside of said cylindrical barrel in at least one position of said plunger; and

a discharge tip in fluid communication with a forward end of said cylindrical barrel.

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14. (New) The syringe of claim 12, wherein said rearwardly facing extension is knurled at least along the portion of said extension adapted to be within an area enveloped by a coupling mechanism.

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15. (New) A syringe for use with a motorized injector, the syringe comprising:

a barrel comprising a forward end, a rearward end, and a conical front wall disposed toward the forward end;

an imaginary longitudinal axis extending through an internal syringe cavity that is defined at least in part by the barrel; and

a plunger disposed in the internal syringe cavity and snugly slidable relative to the barrel, the plunger comprising:

a forwardly facing surface being of a slope which conforms to the slope of an interior of the conical-front wall;

a rearwardly facing surface; and

an drive ram coupling extension protruding out rearwardly along the reference axis from a central portion of the rearwardly facing surface, the extension comprising a plurality of knurls,

wherein each of the knurls is oriented transversely to and disposed about the longitudinal axis, and wherein the plurality of knurls is located along a portion of the extension adapted to be within an area enveloped by a coupling mechanism of an injector drive ram.

16. (New) The syringe of claim 15 wherein a cross-section of the extension taken at an orientation transverse to the reference axis is rectangular.

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17. (New) The syringe of claim 15 wherein a cross-section of the extension taken at an orientation transverse to the reference axis is oval.

18. (New) The syringe of claim 15 wherein a cross-section of the extension taken at an orientation transverse to the reference axis is football-like.

19. (New) The syringe of claim 15 wherein a cross-section of the extension taken at an orientation transverse to the reference axis is circular.

20. (New) The syringe of claim 19 wherein the circle is free of apertures extending therethrough.

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21. (New) A syringe for use with a motorized injector, the syringe comprising:

- a barrel comprising a forward end, a rearward end, and a discharge tip disposed toward the forward end;

- an imaginary longitudinal axis extending through an internal syringe cavity that is defined at least in part by the barrel; and

- a plunger disposed in the internal syringe cavity and snugly slidable relative to the barrel, the plunger comprising:

- a forwardly facing surface;

- a rearwardly facing surface; and

- an drive ram coupling extension protruding out rearwardly along the reference axis from a central portion of the rearwardly facing surface, the extension being free of apertures extending therethrough and comprising a plurality of knurls,

- wherein each of the knurls is oriented transversely to and disposed about the longitudinal axis, and wherein the plurality of knurls is located along a portion of the extension adapted to be within an area enveloped by a coupling mechanism of an injector drive ram.

22. (New) The syringe of claim 21 wherein a cross-section of the extension taken at an orientation transverse to the reference axis is a shape selected from rectangular, oval, circular, and football-like.